

Minutes
Control Protocols Working Group
via WebEx
Tuesday, 27 July 2021

Presiding chairperson: Milton Davis; Doug Fleenor Design

Recording secretaries: Richard Nix and Karl Ruling; ESTA

Members attending:

Ali Alnajjar; Carallon Ltd.; P; MP
Paul Beasley; Walt Disney Company; P; U
Robert Bell; Acuity Brands Inc.; A; MP
Marcus Bengtsson; disguise; P; MP
Scott M. Blair; Megapixel; P; CP
Eric Bloom; Westview Productions; P; DR
John David (Javid) Butler; HDR Consulting LLC; P; DE
Milton Davis; Doug Fleenor Design, Inc.; P; MP
Larry Dew; W.A. Benjamin Electric Co.; O; DE
Matt Didon; ON LX Limited; P; CP
Tucker Downs; Tucker Downs; O; G
Bill Ellis; Candela Controls, Inc.; P; DR
Mitch Hefter; USITT; P; U
Wayne David Howell; Artistic Licence Holdings; P; DE
Leroy "Tripp" Oliver, III; Mainstage Theatrical Supply, Inc.; P; DR
Michael Karlsson; LumenRadio AB; P; MP
Sam Kearney; Electronic Theatre Controls, Inc.; P; MP
Jonathan Kemble; Jonathan Kemble ; O; G
Paul Kleissler; City Theatrical, Inc.; P; MP
Edwin S. Kramer; I.A.T.S.E. Local 1; P; U
Hans Lau; I.A.T.S.E. Local 728; P; U
Michael Lay; Candela Controls, Inc; A; DR
Michael Lichter; Electronic Theatre Controls, Inc.; A; MP
Kevin Loewen; Acuity Brands Inc.; P; MP
Jim Love; Tait Towers Manufacturing LLC; P; MP
Kevin Matz; Company 235, LLC; O; U
Daniel Murfin; Royal National Theatre; P; U
Maya Nigrosh; Sonos; P; MP
Jeremy Powell; Vectorworks, Inc; P; CP
Mark Primrose; Kino Flo, Inc.; P; MP
Shawn Silverman; Lighting Infusion LLC; P; DE
John Valus Jr.; Lex TM3; P; CP
Peter Willis; Howard Eaton Lighting Ltd.; P; CP

1 Opening remarks

Milton Davis called the meeting to order at 11:04. He welcomed everyone to this WebEx meeting.

2 Anti-trust and patent statements

2.1 Reading of the anti-trust statement

Milton Davis read the following statement aloud to the assembly:

ESTA and its members take seriously their obligation to comply with all applicable antitrust laws. Therefore, during this meeting and during all ESTA events, all discussions will be limited to those subjects that are permitted by the antitrust laws. All members should refrain from any discussion or mention of competitively sensitive subjects such as the current or future prices charged for any member product or services, current or future marketing plans or strategies, and current or future

costs, including employee salaries. There also must be no agreement on the suppliers or customers that members will or will not do business with or the markets in which members will conduct business.

Violations of the antitrust laws can have serious consequences. If you have any questions or concerns about anything that is discussed at an ESTA meeting, please bring your concern to ESTA management. An easy to read pamphlet describing the antitrust laws is available from the ESTA staff.

The easy to read pamphlet was displayed. No anti-trust concerns were raised.

2.2 Reading of the call for patents

Milton Davis read the following statement aloud to the assembly:

ESTA intends not to publish any standard that contains protected intellectual property, unless that information can be licensed by anyone for a reasonable fee. ESTA uses a process of open patent and copyright disclosures to implement its intent. ESTA does not conduct patent or copyright searches and does not warrant that its standards contain no protected intellectual property.

In keeping with the open disclosures policy, I ask if anyone present wishes to notify this working group of the existence of a patent, patent application, copyright, or other protected intellectual property that might protect material in a standard being developed by this working group. You need not be the holder of the patent or copyright to notify this working group of its existence.

No protected intellectual property was revealed.

Michael Lay reported that Amscreen does have a trademark for RDM, Remote Device Management, for signage control in the UK. We clearly have the prior art, but the TSC was not interested in taking on a legal challenge unless it impacts our membership. Michael Lay asked if anyone has had problems with Amscreen asserting trademark on "RDM." None did.

3 Attendance and Membership

3.1 Requirements for membership

Milton Davis read the following statement aloud to the assembly:

Membership is open to all parties who are affected by the work of the group; membership in ESTA is not a requirement, but there is a \$100/person/year participation fee to help fund the costs of running the Technical Standards Program. Voting members are required to attend meetings and vote on letter ballots. Any principal member and alternate that both miss three consecutive meetings or that miss three consecutive letter ballots will have their membership status changed to observer. This action will be taken at the beginning of the first meeting after such inaction and will be recorded in the minutes of that meeting.

3.2 Introduction of attendees

Milton Davis asked people to introduce themselves, in the order shown in the participants list. They did.

3.3 Determination of a quorum

There were enough voting members present to cast 27 votes, far more than needed to carry a motion needing a supermajority. A quorum was present.

3.4 Processing of new membership and status change requests

3.4.1 Changes to observer status due to lack of attendance

The following voting members have missed the last two meetings and will be moved to observer status if this meeting is also missed:

Peter Willis; Howard Eaton Lighting Ltd.; CP. Present. No change.

Michael Karlsson; Lumen Radio AB; MP. Late in joining, but present. No change.

3.4.2 New applications

As of 8 July 2021 the following application had been received:

Al DeMayo; LiteGear, Inc.; MP; applying as principal

Al DeMayo was not present. Eddie Kramer moved that he be accepted as an observer member. The motion was seconded. The motion was approved. There were no objections and no abstentions.

3.5 Consensus body

Delegate	Representing	Voting status	Int. cat.
Kevin Loewen	Acuity Brands Inc.	P	MP
Robert Bell	Acuity Brands Inc.	A	MP
Maurits van der Hoorn	Acuity Brands Inc.	A	MP
Wayne David Howell	Artistic Licence Holdings	P	DE
Bill Ellis	Candela Controls, Inc.	P	DR
Brent Boulnois	Candela Controls, Inc.	A	DR
Jim Ohrberg	Candela Controls, Inc.	A	DR
Michael Lay	Candela Controls, Inc	A	DR
Ali Alhajjar	Carallon Ltd.	P	MP
Jason Potterf	Cisco	P	MP
Paul Kleissler	City Theatrical, Inc.	P	MP
Marcus Bengtsson	disguise	P	MP
Milton Davis	Doug Fleenor Design, Inc.	P	MP
Ian Campbell	Doug Fleenor Design, Inc.	A	MP
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	P	U
Sam Kearney	Electronic Theatre Controls, Inc.	P	MP
Steve Terry	Electronic Theatre Controls, Inc.	A	MP
Michael Lichter	Electronic Theatre Controls, Inc.	A	MP
Robert Goddard	Goddard Design Co.	P	MP
John David (Javid) Butler	HDR Consulting LLC	P	DE
Peter Willis	Howard Eaton Lighting Ltd.	P	CP
Edwin S. Kramer	I.A.T.S.E. Local 1	P	U
John Huntington	I.A.T.S.E. Local 1	A	U
Hans Lau	I.A.T.S.E. Local 728	P	U
Alan M. Rowe	I.A.T.S.E. Local 728	A	U
Matthew Ardine	I.A.T.S.E. Local 728	A	U
David Kane	I.A.T.S.E. Local 728	A	U
Mark Primrose	Kino Flo, Inc.	P	MP
Jim Bogdanowicz	Kino Flo, Inc.	A	MP
John Valus Jr.	Lex TM3	P	CP
Shawn Silverman	Lighting Infusion LLC	P	DE
Michael Karlsson	LumenRadio AB	P	MP

Delegate	Representing	Voting status	Int. cat.
Stijn Geysen	Luminex Lighting Control Equipment	P	MP
Rene Berhorst	MA Lighting	P	MP
Leroy "Tripp" Oliver, III	Mainstage Theatrical Supply, Inc.	P	DR
Scott M. Blair	Megapixel	P	CP
Matt Didon	ON LX Limited	P	CP
Simon Newton	Open Lighting Project	P	G
Gary Douglas	Phospec Industries, Inc.	P	MP
Daniel Murfin	Royal National Theatre	P	U
Bill McIntyre	Show Distribution Group, Inc.	P	CP
Jon Hole	Signify	P	MP
Maya Nigrosh	Sonos	P	MP
Jim Love	Tait Towers Manufacturing LLC	P	MP
Julian Hoare	Tait Towers Manufacturing LLC	A	MP
Mitch Hefter	USITT	P	U
Jeremy Powell	Vectorworks, Inc	P	CP
Paul Beasley	Walt Disney Company	P	U
Eric Bloom	Westview Productions	P	DR

Total votes possible	35	
Interest categories subtotals	6	CP
	3	DE
	3	DR
	1	G
	16	MP
	6	U

Voting Status key: P = Principal voter, A = Alternate voter, I = Individual voter
Interest Category key: MP = Mass-market producer, CP = Custom-market producer,
DR= Dealer or rental company, U = User, G = General interest, DE = Designer

4 Approval of the minutes from the last meeting

See *CPmin04-2021_DRAFT.pdf*

Scott Blair moved to approve the draft minutes. The motion was seconded. Peter Willis and Paul Beasley abstained. The rest voted in favor. Motion carried.

5 Approval of agenda

Hans Lau asked to add an item about the intellectual property policy.

Kevin Loewen at Pathway (Acuity Brands) moved to accept the modified agenda. The motion was seconded. The motion was approved with no objections and no abstentions.

6 Old Business

6.1 Standards, Guides & Recommended Practice Maintenance

This is a placeholder in the agenda, so we don't forget to maintain them. Documents prefaced with an asterisk () are on the agenda elsewhere for reports or action.*

ANSI E1.3 – 2001 (R2021), Entertainment Technology - Lighting Control Systems - 0 to 10V Analog Control Specification & Application Guide For ANSI E1.3 – 2004 Lighting Control Systems 0 to 10V Analog Control Specifications. (Revision, reaffirmation or withdrawal by 20 May 2026)

ANSI E1.11 – 2008 (R2018), Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories. (Revision, reaffirmation, or withdrawal by 31 May 2023)

ANSI E1.17 – 2015 (R2020) Entertainment Technology - Architecture for Control Networks (ACN) (Revision, reaffirmation, or withdrawal by 23 March 2025)

*BSR E1.20 - 20xx, Remote Device Management over USITT DMX512. (In public review cycle)

ANSI E1.27-1 – 2006 (R20121), Entertainment Technology - Standard for Portable Control Cables for Use with USITT DMX512/1990 and E1.11 (DMX512-A) Products. (Revision, reaffirmation or withdrawal by 20 May 2026)

ANSI E1.27-2 – 2009 (R2019), Entertainment Technology - Recommended Practice for Permanently Installed Control Cables for Use with ANSI E1.11 (DMX512-A) and USITT DMX512/1990 Products. (Revision, reaffirmation or withdrawal by 21 July 2024)

ANSI E1.30-1 – 2010 (R2016), EPI 23, Device Identification Subdevice. (Revision, reaffirmation or withdrawal by 20 May 2026)

ANSI E1.30-3 – 2009 (R2019), EPI 25, Time Reference in ACN Systems Using SNTP and NTP. (Revision, reaffirmation or withdrawal by 21 July 2024)

ANSI E1.30-4 – 2010 (R2021), EPI 26, Device Description Language (DDL) Extensions for DMX512 and E1.31 Devices. (Revision, reaffirmation, or withdrawal by 27 May 2026)

ANSI E1.30-10 – 2009 (R2019), EPI 32, Identification of Draft Device Description Language Modules. (Revision, reaffirmation or withdrawal by 21 July 2024)

ANSI E1.30-11 - 2019, EPI 33, Transport of root PDUs over TCP (Published on 25 June 2019. Revision, reaffirmation or withdrawal by 22 March 2024)

ANSI E1.31 - 2018, Lightweight streaming protocol for transport of DMX512 using ACN (Revision, reaffirmation, or withdrawal by 31 August 2023)

*ANSI E1.33 – 2019, Transport of ANSI E1.20 (RDM) in an E1.31 environment (Revision, reaffirmation or withdrawal by 28 May 2024)

ANSI E1.37-1 – 2012 (R2017), Additional Message Sets for ANSI E1.20, Remote Device Management. (Revision, reaffirmation, or withdrawal by 18 May 2022)

ANSI E1.37-2 – 2015 (R2021), Additional Message Sets for ANSI E1.20 (RDM) – Part 2, IPv4 & DNS Configuration Messages. (Revision, reaffirmation, or withdrawal by 24 June 2026)

*BSR E1.37-4 – 201x, Remote Device Management over DMX512 Networks – File Transfer Control with Firmware Upload capabilities.(currently in public review cycle)

*BSR E1.37-5 – 20xx, General Purpose Messages for ANSI E1.20 RDM (currently in public review cycle)

ANSI E1.37-7 - 2019, Additional Message Sets for ANSI E1.20 (RDM) - Gateway and Splitter Configuration (Published on 05 July 2019. Revision, reaffirmation or withdrawal by 04 May 2024)

*BSR E1.59, Object Transform Protocol (Published 28 January 2021. Now in revision.)

Application Guide for ANSI E1.3 - 2001, Lighting Control Systems 0 to 10V Analog Control Specification

Recommended Practice for Ethernet Cabling Systems in Entertainment Lighting Applications

Supplement to the Recommended Practice for Ethernet Cabling in Entertainment Lighting Applications

Withdrawn standards

E1.45 - 2013 (W2015), Unidirectional Transport of IEEE 802 data frames over ANSI E1.11 (DMX512A)

E1.30-7 - 2009 (W2016), EPI 29, Allocation of Internet Protocol Version 4 Addresses to ACN Hosts

6.2 BSR E1.20 – 201x, Remote Device Management over USITT DMX512

Wayne Howell/Scott Blair. Reflectors: e1.20@esta.org, rdmtg_standards@esta.org

See [Summary_E1-20_3rdReviewComments.pdf](#) for third public review comment summary.

Wayne Howell reported that E1.20 had finished public review recently and there are comments to resolve. He did not sense that any of the comments are show-stoppers, that they will require detail clarification.

Peter Willis raised his concern, also expressed in his public review comments, about the increase in the number of subdevices. He doesn't think this increase is necessary and finds creating products to support a number of subdevices lower than the proposed maximum number daunting.

6.3 BSR E1.37-4, Remote Device Management over DMX512 Networks – File Transfer Control with Firmware Upload capabilities

Reflector: e137@esta.org, a general E1.37-x reflector.

The last public review ended 9 April 2018. Peter Willis is the task group leader. Comment resolution progress report.

Peter Willis says he has absolutely no bandwidth—he's fielding service calls even as this meeting is going on. He would really like a co-host to work on this. It would be good if someone doing this were facile with the Access database the comments are in. Peter Willis does not expect to have any time free until the West End is back running, which would be in September.

6.4 BSR E1.37-5, General Purpose Messages for ANSI E1.20 RDM

Scott Blair/Simon Newton. Reflector: e137@esta.org, a general E1.37-x reflector.

See [Summary_E1-37-5_5thPublicReviewComments.pdf](#)

Scott Blair reported that progress is being made.

6.5 BSR E1.37-8, Additional Message Sets for ANSI E1.20 (RDM) – IPv6 & Improved IPv4 Configuration Messages.

Scott Blair/Dan Murfin Progress report? Call for task group members. e137-8@esta.org

Scott Blair reported that he's started working on the shell of the document. A task group meeting is set up for later the week of this working group meeting.

6.6 BSR E1.68 Recommended Practice to address DMX512 compliance and interoperability

Javid Butler/Wayne Howell. Reflector: ProtocolsCompliance@esta.org.

Progress report.

Javid Butler reported. He thanked people for participating in the informal review, particularly Maya Nigrosh, who spent about 50 hours on comments. There is editorial work to do.

He reported that the pandemic snap-back is making for a heavy workload—probably for everyone on the working group.

6.7 BSR E1.63 Network Advertisement of Entertainment Protocols

Jason Potterf/Kevin Loewen. Reflector: NAEP@esta.org

Progress report.

Kevin Loewen reported that there has been little progress.

6.8 BSR E1.73, Next Generation Entertainment Control Model: Uniform Device Representation (UDR)

Dan Murfin/Sam Kearney: progress report. Reflector: NextGenLibrary@esta.org

Progress report.

Sam Kearney said there's a lot of work being done, but there is not a document yet. They have been working on a specification for how data is organized and are trying to model some real data for different luminaires and other devices. He expects a draft document later this year.

6.9 Next Gen Study Group (Overall)

Jason Potterf/Maya Nigrosh: progress report. Reflector: nextgencontrolprotocol@esta.org

Any news or action?

Maya Nigrosh suggested we skip over this and go to item 6.10. We did.

6.10 Next Gen Transport study group

Jason Potterf/Maya Nigrosh: progress report. Reflector: NextGenTransport@esta.org

Progress report.

Maya Nigrosh reported that they are still evaluating protocols. They are working with library group (BSR E1.73) to make sure that their data will be supported by the transport.

6.11 Protocol Security study group

Kevin Loewen/Paul Beasley: progress report. Reflector: CPWG_Secure@esta.org

Progress report.

Kevin Loewen reported that they have made some progress, gotten it off the ground. Working on a simple wrapper for sACN, and leaving a security wrapper for RDM-net as work for the future. At the next meeting, they would like to shift from a task group to a formal American National Standard project—but that project proposal would be for the next or a later meeting.

6.12 GitHub study group

Jason Potterf. Reflector: CPWG_github_study@esta.org. Progress report.

Jason Potterf said that the GitHub study group is on hiatus.

6.13 IEEE report on single-pair Ethernet

Jason Potterf to report on IEEE 802.3cg progress.

Jason Potterf had sent a report via email to Michael Lay. He read to the CPWG:

“IEEE 802.3cg 10Base-T1S and 10Base-T1L Single Pair Ethernet equipment is starting to enter the market, enabling short network segments without power and longer point to point networks with power. IEEE 802.3da is in progress to add multi-drop power and potentially enhance the reach and node count of a multi-drop network, but is moving slowly due to industry attention being paid to the first wave of product development

around the single pair standard. There is also a new study group planning point-to-point enhancements to enable time synchronization and in the future 100 Mbit rates over a single pair of conductors. Anyone who is interested in this technology, please feel free to contact Jason Potterf for more information.”

6.14 ANSI E1.33 – 2019, Transport of ANSI E1.20 (RDM) in an E1.31 environment

Scott Blair/Sam Kearney: errata sheet progress report. Reflector: e133@esta.org

There was discussion. The conclusion was that the CPWG will decide what to do with the errata when it is available to the CPWG.

6.15 BSR E1.59 - 2021, Object Transform Protocol

Dan Murfin and Maya Nigrosh. Reflector: e159@esta.org

Dan Murfin reported on the work to add camera tracking capability. There is a lot of data that might need to be transported, two to three times the number of existing fields. He is confident that there will be a draft document available for the next meeting.

6.16 Task group leader coordination

*Scott Blair is the official scheduling liaison for meetings between the CPWG task groups and meeting schedulers. Frances Thompson handles face-to-face meetings when we meet at an ESTA event. Richard Nix handles meetings scheduled using ESTA's WebEx account—**only** ESTA's WebEx account. Task groups are free to use their own WebEx accounts, Zoom, Teams, Meet, or something else.*

BSR E1.20: Scott Blair and Wayne Howell

E1.37-x: Video Walls Scott Blair

BSR E1.37-2: Simon Newton (No work being done, said Scott.)

BSR E1.37-4: Peter Willis

BSR E1.37-5: Scott Blair and Simon Newton

BSR E1.37-6: Simon Newton (pretty much abandoned, said Scott.)

BSR E1.37-8 Scott Blair and Dan Murfin

BSR E1.59: Dan Murfin and Maya Nigrosh

E1.61 NAEP: Jason Potterf and Kevin Loewen

E1.68: Javid Butler and Wayne Howell

E1.73: Dan Murfin and Sam Kearney

Next Gen Study Group: Jason Potterf and Maya Nigrosh

Plugfest Marketing Task Group: Michael Lay

NAMM Education Task Group: Milton Davis

Next Gen Transport study group: Maya Nigrosh and Jason Potterf

Protocol Security study group: Kevin Loewen and Paul Beasley

GitHub study group: Jason Potterf

7 New business

7.1 A call for NAMM 2022 seminars

Milton Davis reported that NAMM may be returning to Anaheim, face-to-face meetings. He asked for ideas and suggestions for educational sessions be emailed to him: milton@dfd.com.

7.2 Intellectual property policy

Hans Lau suggested that we change our IP policy to require mandatory disclosure, since we are now venturing into the realm of new protocols, etc.

Karl Ruling said that our policy adopts ANSI's requirements by reference, and that the IP statement made at every meeting is verbatim what our attorney has approved. There was more discussion. Hans Lau said that SMPTE has a good policy statement, which he will send to Karl Ruling. Karl Ruling said it would be considered by the Technical Standards Council.

8 Other business and announcements

8.1 National Electrical Code (NEC) update

Jason Potterf and Mitch Hefter.

Mitch Hefter reported that the second draft of the NEC is available for comment. He pointed out the revisions to Article 530 and changes to emergency lighting in 700.11. All the definitions are moved to the front in Article 100. Some of the new Article 530 definitions were not moved in to the new Article 100, so they were lost.

Hefter said that you have to comment on-line on the NFPA website. You have to register, but registration costs nothing. Changed text is not marked, so you need to compare the on-line version with your own copy of the NEC 2020.

There was a discussion of an alternate for Jason Potterf on Code Panel 18, so he has a backup.

8.2 Illuminating Engineering Society update

Bill Ellis and Mitch Hefter.

Bill Ellis reported that the museum group is working on advice about light exposure and media degradation.

Mitch Hefter said that the controls committee is working on the intent narrative.

Bill Ellis reported that TTFL is now the Assembly and Performance Lighting Committee so film or video lighting will be in a different group.

8.3 Plugfests

8.3.1 Europe

Peter Willis reported that talk is going on for planning a Plugfest in the UK. Probably in the early part of next year, the traditional time (late February), but perhaps it might be later. Much later runs into the European exhibition season, which would be a problem.

8.3.2 USA

Michael Lay reported they would like to meet in Texas if we have face-to-face meetings there again.

8.4 Above & Beyond Awards

Milton Davis said that information on the Above & Beyond Awards is available at http://tsp.esta.org/tsp/news/award_recipients.html. Nominate someone deserving.

9 Schedule for future meetings

The meeting schedule may be found at <http://www.esta.org/ESTA/meetings.php>. The autumn meetings are not yet set, but they will be the last week of September and the first week of October, reported Richard Nix. The meetings will be on-line. [*The meeting schedule with specific dates has been posted since this meeting.*]

Scott Blair reported on the task group meetings coming later this week.

10 Adjournment

Scott Blair moved we adjourn. The motion was seconded. Hearing no objections and having reached the end of the agenda, Milton Davis declared the meeting adjourned at 12:24.

Control Protocols Working Group members and contact information as of 31 August 2021

Delegate	Representation	Voting status	Int. cat.
Cameron Affleck	Cameron Affleck	O	U
Christian Allabauer	Christian Allabauer	O	G
Ali Alnajjar	Carallon Ltd.	P	MP
Matthew Ardine	I.A.T.S.E. Local 728	A	U
Benjamin Eagen Arrigo	Benjamin Eagen Arrigo	O	U
Tim Bachman	Altman Lighting	O	MP
Nick Ballhorn-Wagner	Electronic Theatre Controls, Inc.	O	MP
Robert Barbagallo	Solotech Inc.	O	U
Tom Barthel-Steer	Electronic Theatre Controls, Inc	O	MP
Paul Beasley	Walt Disney Company	P	U
Robert Bell	Acuity Brands Inc.	A	MP
Marcus Bengtsson	disguise	P	MP
Justin Bennett	University of the Incarnate Word	O	U
Rene Berhorst	MA Lighting	P	MP
Andrew Berry	X-Laser	O	MP
Scott M. Blair	Megapixel	P	CP
Eric Bloom	Westview Productions	P	DR
Jim Bogdanowicz	Kino Flo, Inc.	A	MP
Pete Borchetta	Altman Lighting	O	MP
Brent Boulnois	Candela Controls, Inc.	A	DR
Justyn Butler	JBOTS	O	CP
John David (Javid) Butler	HDR Consulting LLC	P	DE
Ian Campbell	Doug Fleenor Design, Inc.	A	MP

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Delegate	Representation	Voting status	Int. cat.
Jean-Francois Canuel	A.C. Lighting Ltd.	O	CP
Steve Carlson	High Speed Design, Inc.	O	MP
Yongzhi Chen	Guangzhou Haoyang Electronic Co., Ltd.	O	CP
Anthony Chiappone	Chauvet Lighting	O	MP
Martin Chisnall	Martin Chisnall	O	U
Jon Chuchla	Audio Visual Systems, Inc.	O	G
Gareth Conner	Creative Conners, Inc.	O	MP
Fraser Connolly	Obsidian Controls	O	DE
Chris Conti	PRG	O	DR
Milton Davis	Doug Fleenor Design, Inc.	P	MP
Jeremy Day	Lumenpulse Group	O	MP
Al Demayo	LiteGear, Inc.	O	MP
Steve Denim	Electronic Theatre Controls, Inc.	O	MP
Larry Dew	W.A. Benjamin Electric Co.	O	DE
Matthew Dews	Electronic Theatre Controls, Inc	O	MP
Matt Didon	ON LX Limited	P	CP
Rich Dionne	Purdue University	O	DE
Gary Douglas	Phospec Industries, Inc.	P	MP
Tucker Downs	Tucker Downs	O	G
Hamish Dumbreck	James Embedded Systems Engineering	O	MP
James Eade	ABTT	O	G
Bill Ellis	Candela Controls, Inc.	P	DR
Paul K. Ericson	Stantec	O	DE

Control Protocols Working Group members and contact information as of 31 August 2021

Delegate	Representation	Voting status	Int. cat.
Trevor Forrest	Helvar Lighting Control	O	MP
Mike Garl	Mike Garl Consulting LLC	exf	
Stijn Geysen	Luminex Lighting Control Equipment	P	MP
Robert Goddard	Goddard Design Co.	P	MP
Nicolas Goerg	Rosco Laboratories	O	CP
Sean Goossen	LiteGear, Inc.	O	MP
Jerry Gorrell	Theatre Safety Programs	O	G
Erin Grabe	ESTA	exf	G
Matt Halberstadt	Electronic Theatre Controls, Inc	O	MP
Sean Harding	Port Lighting Systems	O	G
Nick Harper	Nick Harper	O	G
Robert Haycock	UC Berkeley	O	U
Mitch Hefter	USITT	P	U
Julian Hoare	Tait Towers Manufacturing LLC	A	MP
Jon Hole	Signify	P	MP
Maurits van der Hoorn	Acuity Brands Inc.	A	MP
Wayne David Howell	Artistic Licence Holdings	P	DE
John Huntington	I.A.T.S.E. Local 1	A	U
Leroy "Tripp" Oliver, III	Mainstage Theatrical Supply, Inc.	P	DR
Quinten James	QtoCue Lighting Design	O	U
Eric Johnson	Eric Johnson	O	G
Rob Johnston	Interactive Technologies, Inc.	O	MP
David Kane	I.A.T.S.E. Local 728	A	U

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Michael Karlsson	LumenRadio AB	P	MP
Sam Kearney	Electronic Theatre Controls, Inc.	P	MP
Jonathan Kemble	Jonathan Kemble	O	G
Chris Kennedy	Chauvet Lighting	O	MP
Bill Kirby	Crescit Software, Inc.	O	G
Paul Kleissler	City Theatrical, Inc.	P	MP
Lucas Korytkowski	Insight Lighting	O	MP
Edwin S. Kramer	I.A.T.S.E. Local 1	P	U
Christian Krueger	Blizzard Lighting LLC	O	MP
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	P	U
Jason Kyle	JPK Systems Ltd.	O	MP
Hans Lau	I.A.T.S.E. Local 728	P	U
Michael Lay	Candela Controls, Inc	A	DR
Hans Leiter	Electronic Theatre Controls, Inc.	O	MP
Jon Lenard	Applied Electronics	O	MP
Michael Lichter	Electronic Theatre Controls, Inc.	A	MP
Kevin Loewen	Acuity Brands Inc.	P	MP
Jim Love	Tait Towers Manufacturing LLC	P	MP
Rob Love	Insight Lighting	O	MP
Vangelis Manolis	AtlaBase Ltd.	O	CP
Kevin Matz	Company 235, LLC	O	U
David McCulloch	David McCulloch	O	U
Bill McIntyre	Show Distribution Group, Inc.	P	CP

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John Mehlretter	Lehigh Electric Products Co.	O	MP
Daniel Murfin	Royal National Theatre	P	U
John Musarra	John Musarra	O	U
Simon Newton	Open Lighting Project	P	G
Maya Nigrosh	Sonos	P	MP
Richard J. Nix	ESTA	exf	G
Jim Ohrberg	Candela Controls, Inc.	A	DR
Jaxon Patterson	Insight Lighting	O	MP
Soren Sterdorff Peglau	Brother, Brother and Sons	O	MP
Jason Potterf	Cisco	P	MP
Jeremy Powell	Vectorworks, Inc	P	CP
Mark Primrose	Kino Flo, Inc.	P	MP
Gary Pritchard	LSC Control Systems Pty Ltd	O	MP
Charles Reese	Production Resource Group	O	DR
Alan M. Rowe	I.A.T.S.E. Local 728	A	U
Karl G. Ruling	ESTA	exf	G
Yngve Sandboe	Sand Network Systems, Inc.	O	MP
Nicolai Gubi Schmidt	Nicolai Gubi Schmidt	O	U
Ford Sellers	Chauvet Lighting	O	MP
Shawn Silverman	Lighting Infusion LLC	P	DE
Bart Swinnen	Luminex Lighting Control Equipment	O	MP
Steve Terry	Electronic Theatre Controls, Inc.	A	MP
Richard Thompson	Electronic Theatre Controls, Inc	O	MP

Control Protocols Working Group members and contact information as of 31 August 2021

Delegate	Representation	Voting status	Int. cat.
Christopher B. Tilton	About the Stage, LLC	O	DE
Robert Timmerman	Signify	O	MP
Tracy Underhill	Triple C Lighting & Controls	O	G
John Valus Jr.	Lex TM3	P	CP
Carlo Venturati	Clay Paky S.P.A.	O	MP
Will Wagner	Carallon Ltd.	O	MP
Colin Waters	TMB	O	DR
Ralph Weber	ENDL Texas	O	G
Peter Willis	Howard Eaton Lighting Ltd.	P	CP
Loren Wilton	Showman Systems	O	CP
David Yellin	Sumolight GmbH	O	MP
Jeong Sik Yoo	Ghost LX	O	DE

Voting Status key: P = Principal voter, A = Alternate voter, I = Individual voter; O = Observer (non-voter); exf = ex officio, non-voting

Interest Category key: MP = Mass-market producer, CP = Custom-market producer, DR= Dealer or rental company, U = User, G = General interest, DE = Designer